

**SECTION 7 GUIDELINES - Snake River Basin Office**  
***Spiranthes diluvialis***  
**Ute Ladies'-tresses (threatened)**

**I. BACKGROUND**

**Legal Status**

*Spiranthes diluvialis* (SPDI) was listed as threatened on January 17, 1992 (57 FR 2048) due to a variety of factors, including habitat loss and modification, and hydrological modifications of existing and potential habitat areas (see “Summary of Threats” section below).

**Species Description**

*Spiranthes diluvialis* is a perennial, terrestrial orchid with stems 20 to 50 centimeters (cm) (8 to 20 inches) tall, arising from tuberously thickened roots. Its narrow leaves are about 11 inches long at the base of the stem, and become reduced in size going up the stem. The inflorescence generally consists of 7 to 32 (mean = 16) small white or ivory flowers clustered into a spike arrangement at the top of the stem (Sipes and Tepedino 1995). The species is characterized by whitish, stout, ringent (gaping at the mouth) flowers. The sepals and petals, except for the lip, are rather straight, although the lateral sepals are variably oriented with these often spreading abruptly from the base of the flower. Sepals are sometimes free to the base.

SPDI is very similar morphologically to *S. romanzoffiana*; thus, it is normally possible to positively identify Ute ladies'-tresses only when it is flowering (see attached line drawings and descriptions). Both species may occur in similar habitats, and the distribution of SPDI can overlap with *S. romanzoffiana*, especially above 5,000 feet elevation. Due to its similarity to *S. romanzoffiana*, only a qualified, experienced botanist will be able to positively identify SPDI. Because SPDI was first described in 1984 (Sheviak 1984), it is not found in many commonly used botanical keys.

It is not uncommon for orchids to exhibit prolonged dormancy. Orchid seeds generally require specific symbiotic associations with mycorrhizal fungi for germination. Many *Spiranthes* species persist underground for several years before leaves emerge above ground. In addition, some species of *Spiranthes* do not consistently flower in consecutive years, and may persist underground due to their relationship with mycorrhizal fungi (USFWS 1995a).

In Idaho, SPDI generally blooms from early August through mid-September, depending on microsite and climatic conditions. At various sites throughout its range, this species may begin blooming in early July or flower as late as early October.

SPDI populations can have a staggered flowering pattern, i.e., some plants may be in fruit while others are still in bud stage. This staggered phenology may be adaptive, or reflect unique microsite conditions for individual plants (Heidel 1997).

### **Population Size/Location**

SPDI is currently known from Colorado, Idaho, Montana, Nebraska, Utah, Washington, and Wyoming. The total population for this species is approximately 25,000 to 30,000 individuals. Historically, the species was known from Colorado, Utah, and Nevada, although it is thought to be extirpated from Nevada.

In Idaho, surveys for SPDI first began in 1997, in which a total of 201 plants were observed at three sites. Since that time, the observed SPDI population has ranged from approximately 1000 to 4,200 plants in 23 occurrences along the South Fork of the Snake River between Swan Valley and the confluence with the Henry's Fork (Moseley 1997; Murphy 2000; Figure 1). These occurrences range in size from several plants to over one thousand individuals. Most of the Idaho sites are very small (less than one acre in size, based on the amount of occupied habitat).

### **Habitat**

In habitat throughout the species range, SPDI is endemic to mesic or wet meadows and riparian/wetland habitats in relatively low elevations near springs, seeps, lakes, or perennial streams (Moseley 1998). Soils may be inundated early in the growing season, normally becoming drier but retaining subsurface moisture through the season. (However, particularly in drought years, subsurface moisture may not be present within 12 inches below the soil surface.) Elevations of known orchid occurrences range from approximately 700 to 6,800 feet (ft).

Generally, this species occurs below the coniferous zone in areas where the vegetation is relatively open (e.g., grass and forb-dominated sites), but some populations are found in riparian woodlands (such as cottonwoods) in Colorado, Utah, and Idaho and in riparian shrub (e.g., willow thickets) communities (Moseley 1998). Soils range from fine silt/sand to gravel and cobbles, sometimes highly organic or peaty soils. In some areas, the wetland habitats and soils that support this species are moderately to strongly alkaline.

SPDI may survive in areas where streams remain in a natural condition, or where conditions mimic naturally created and maintained habitat. For example, it may be found along old gravel pits that have been restored as wetlands, in irrigated pastures, or below leaky diversion dams and irrigation canals.

## Idaho:

SPDI was first discovered in Idaho in 1996 along the South Fork of the Snake River in eastern Idaho. All known occurrences of SPDI in Idaho, to date, are found along the South Fork of the Snake River, generally between Swan Valley, downstream to the confluence with the Henry's Fork (Figure 1). Along the South Fork, SPDI occurs in a variety of areas including swales, mesic meadows, cottonwood stands, and islands. These areas contain at least some component of grass and/or forb-dominated habitat. However, SPDI plants can be surrounded by, or located in close proximity, to shrubs or trees, such as willows, silverberry, or cottonwoods. Associated species may include: *Agrostis stolonifera* (bentgrass), *Carex lanuginosa* (woolly sedge), *Eleocharis rostellata* (beaked spikerush), *Eleagnus commutata* (silverberry), *Habenaria dilatata* (bog orchid), *Juncus balticus* (Baltic rush), *Equisetum* spp. (horsetails), *Salix exigua* (sandbar willow), *S. lutea* (yellow willow), and narrowleaf cottonwood (*Populus angustifolia*) (Moseley 1997a, 1997b).

## **Summary of Threats**

The riparian and wetland habitats that support this species have been heavily impacted by urban development, stream channelization, water diversions and other watershed and stream alterations that degrade natural stream stability and diversity. Conversion of riparian/ floodplain land to agricultural uses has destroyed habitat for SPDI in many areas. Many SPDI populations are located on private land, and have no long-term protection. In addition, because SPDI occurs in small, scattered groups, it is vulnerable to natural and human-caused disturbances. The effects of grazing, recreation, and other factors are discussed below.

## Grazing

Sexual reproduction is critical to the life cycle of SPDI. To reproduce, SPDI must be able to produce flowers, fruits, and seeds. Plants that are damaged or destroyed before seed set by factors such as grazing, trampling, etc. are not able to reproduce successfully. Livestock grazing can impact SPDI directly by trampling and/or consumption of SPDI plants. In addition, grazing can impact SPDI indirectly by soil compaction, channel incision that leads to lowered water tables, and increased rodent herbivory (e.g., in exclosures).

## Changes in Hydrology

Stream processes have been altered by a variety of activities, including the development of reservoirs, dams, and diversions for urban and/or agricultural uses. It may be difficult to maintain or reinstitute instream flows, especially flows that mimic a natural hydrograph. Compaction, resulting from grazing, construction, and/or recreational activities, can also lead to changes in hydrology. It is possible that in some areas, groundwater withdrawals may negatively affect the habitat for this species.

## Recreation

The construction and maintenance of roads, trails, boat ramps, and campgrounds could adversely affect SPDI habitat. Off-road vehicle use can also damage individuals and habitat for SPDI. However, dispersed “minimum impact” recreation activities such as rafting and hiking are not likely to severely degrade habitat for this species.

## Exotic Species

Exotic plant species can adversely affect habitat for SPDI. For example, species such as purple loosestrife (*Lythrum salicaria*), whitetop (*Cardaria* sp.), Russian olive (*Eleagnus angustifolia*), and reed canarygrass (*Phalaris arundinaceae*) can threaten the reproduction of SPDI. In the Boulder, Colorado area, uncontrolled Canada thistle growth has prevented SPDI from flowering and reproducing.

## Pollinator Impacts

Pollination by bumblebees (considered to be the primary pollinators of SPDI) is essential to this species’ sexual reproduction. Management of SPDI should be based on an ecosystem or community approach, and must consider the requirements of pollinators of SPDI. In some areas, a scarcity of pollinators may limit the reproduction of SPDI (Sipes and Tepedino 1995). Pollinators of SPDI (i.e., bumblebees and other native bees) may depend on associated plant species for pollen and/or nectar sources, and may utilize various physical and/or biological habitat features for nesting. For example, bees may nest in the ground, or in downed or standing trees and logs. Trampling impacts from grazing could impact ground-nesting bees (Sugden 1985).

Maintaining floral diversity in SPDI habitat is critical. Pollinators of SPDI must collect pollen from other flowering species; if no pollen source is located nearby, it is unlikely that bumblebees would visit SPDI (Sipes and Tepedino 1995). Since bumblebees forage from early spring until late autumn, species flowering before SPDI are important for attracting and maintaining bumblebee colonies in the area (Sipes and Tepedino 1995).

## Herbicide and Pesticide Use

Herbicides and pesticides may negatively impact this species, either directly or indirectly (e.g., via drift). Herbicides and pesticides may be used by Federal agency staff (and other parties) in areas including campgrounds, agricultural sites, and roads. SPDI habitat could be present in or adjacent to such areas.

Pesticide spraying can negatively affect pollinators of SPDI. The activity period of bumblebees (the primary pollinators of SPDI) makes them vulnerable to insecticide spraying from spring to early autumn (Sipes and Tepedino 1995).

## Habitat Conversion

Many wetland areas throughout the range of SPDI have been converted to agriculture or urban/suburban development. In addition, the use of heavy equipment associated with agricultural or other activities (including construction and road or facility maintenance) can impact this species directly by destruction of individuals, or indirectly by soil compaction and possible subsequent changes in hydrology.

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U.S. Fish and Wildlife Service. 1995b. Recommendations and guidelines for Ute ladies'-tresses orchid (*Spiranthes diluvialis*) recovery and fulfilling section 7 consultation responsibilities (dated June 1, 1995). Prepared by the Ute ladies'-tresses recovery team, USFWS, Salt Lake City, Utah. 19 pp. plus attachments.

### **Contacts**

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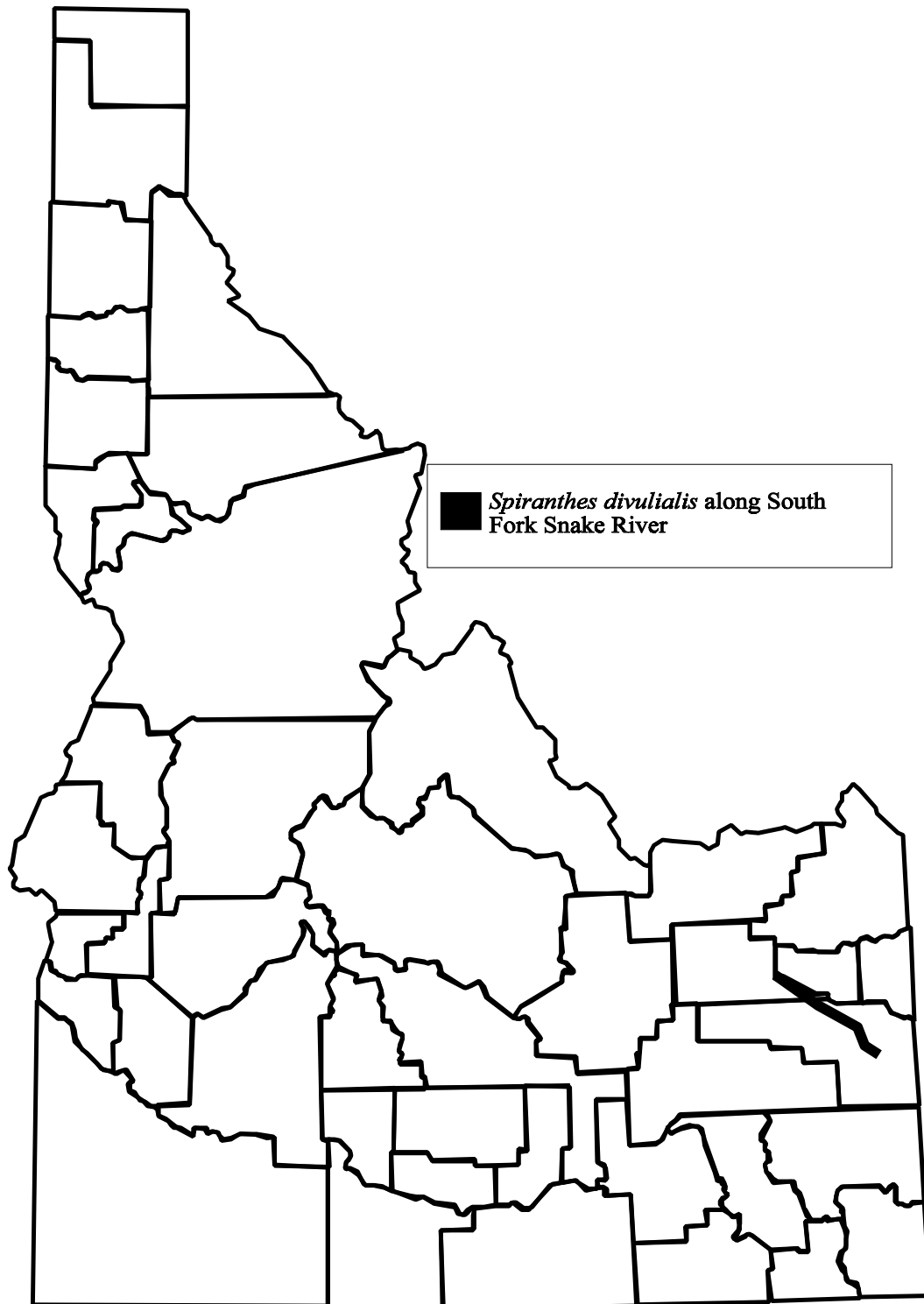


Figure 1 - SPDI. Known distribution of *Spiranthes diluvialis* in Idaho. (as of 4/01).

## **II. GUIDELINES - Protocol for Evaluating Project Effects**

Ensure that proposed or ongoing actions are consistent with these guidelines and recovery objectives. Ground disturbing activities should not be allowed within habitat occupied by this species (along the South Fork of the Snake River, generally between Swan Valley, downstream to the confluence with the Henry's Fork). Actions that may alter hydrology (including but not limited to stream channelization, mining, or reservoir operation/development) should be reviewed for potential impacts to SPDI. Any activities that involve trampling or soil compaction (such as recreational activities, grazing, and maintenance or construction projects) should also be reviewed. (Refer to the "Summary of Threats" section for more information on activities that may affect this species.)

In Bonneville, Jefferson, or Madison Counties, SPDI should be considered when reviewing projects and activities that may affect riparian or wetland habitats ranging from 700 to 6,800 feet which are below the coniferous vegetative zone. The potential for SPDI should be considered when visiting wetlands or streams for any purpose, and when reviewing projects including: fishery, wetland, or stream enhancement or alteration projects; hydroelectric projects and Clean Water Act Section 404 permit applications; and when conducting surveys for other species of interest that may be in or near potential orchid habitat in these three counties. Although SPDI has been found only along the South Fork of the Snake River in Idaho, it is possible that this species may be found in other areas which contain suitable habitat.

Surveys should be conducted during the flowering season for SPDI (i.e., when it is identifiable) in areas of known and/or potential habitat before grazing by domestic livestock occurs. Surveys conducted during or after grazing occurs are not likely to yield valid results regarding the presence or absence of SPDI. Overgrazing in riparian habitat may adversely affect not only SPDI, but the entire community (see "Summary of Threats" section for additional information regarding grazing and SPDI).

### Potential Habitat

In Idaho counties, other than Bonneville, Jefferson, and Madison, the Service encourages surveys in potential SPDI habitat. Generally, potential habitat may be found from 700 to 6,800 feet in areas where suitable hydrology exists (e.g., at isolated springs/seeps, wet meadows, or riparian areas). Soils will likely be moist to the surface or have subsurface moisture throughout the growing season. Some sites may be periodically flooded or inundated. The presence of associated species (see "Habitat" section) is another indicator of potential habitat.



Given its distribution and the variety of habitats in which SPDI is found, it is not possible to narrowly define potential habitat for this species. Experience indicates that, although potential habitat may be fairly widespread, actual occurrences of SPDI are rare. However, certain physical and/or biological characteristics can help evaluate whether habitat is not present, or is not suitable for SPDI (see “Disqualified Habitat” section below).

Disqualified Habitat (adapted from USFWS 1995b)

- C appropriate hydrology not present, typically indicated by: a) area composed of mostly upland vegetation, and/or b) area dries up by mid-July, with water table lower than 12 inches below the surface
- C site heavily disturbed, e.g.:
  - C stream banks channelized and stabilized by heavy riprap
  - C highway rights-of-way built on filled or compacted soil or rock material
  - C construction sites where construction has either stripped the topsoil or where construction has been completed within the last 5 years but the area has not been revegetated
- C Note: SPDI has been found in some heavily disturbed sites where hydrology is appropriate, such as revegetated gravel pits, grazed riparian edges and pastures, and along well-traveled trails developed on old berms
- C habitat above the coniferous vegetative zone
- C stream banks steep; transition from stream margin to upland areas abrupt
- C site characterized by standing water with cattails, bulrushes, and other aquatic vegetation (note that the margins of such areas may be suitable habitat, and SPDI has been found in areas that are temporarily inundated)
- C riparian areas or stream banks vegetated by dense rhizomatous species such as reedgrass (*Phalaris arundinacea*), tamarisk (*Tamarix ramosissima*), teasel (*Dipsacus sylvestris*), common reed (*Phragmites australis*), or saltgrass (*Distichlis spicata*)
- C riparian areas overgrazed or managed such that the vegetation is composed of upland native or weedy species or is unvegetated; in some cases, SPDI may tolerate overgrazing as long as it has not resulted in a drop of the water table or conversion of the community to upland or weedy species (refer to Threats section for more information on grazing)

- C potential habitat has been converted to agricultural uses and is now plowed and cropped, or has been converted to lawns or golf courses
- C wetland is a brackish playa or pothole not fed by springs, or not in the floodplain of or hydrologically connected with a riparian system or other source of fresh water

#### Survey Guidelines:

Surveys should be required as part of the Section 7 consultation in Bonneville, Jefferson, and Madison Counties, within watersheds containing known habitat for this species (e.g. South Fork of the Snake River floodplain). In Bonneville, Jefferson, and Madison Counties, surveys should be conducted for projects that could affect large areas of potential habitat where known populations of SPDI have not been found and surveys have been conducted for less than three years. Examples of such projects include, but are not limited to: stream channelization and stabilization, stream habitat improvement, projects that impact downstream hydrology such as dams, diversions, hydropower, road/highway construction, gravel mining, and streamside recreation trails.

SPDI surveys should be conducted in watersheds that are adjacent to or essentially similar in character to those where the orchid is currently known to occur. Surveys are recommended when large areas of potential habitat will be impacted and/or when planning schedules permit surveys prior to project commencement. Project proponents should be alerted and encouraged to schedule project planning to allow time for orchid surveys.

#### Brief Summary of Survey Protocol:

- C Surveys should be conducted by a trained botanist according to the Rare Plant Inventory Guidelines (attached).
- C Surveys should be conducted during the peak flowering period, generally from mid-August through mid-September.
- C Surveys should be conducted by walking or otherwise closely scrutinizing potential habitat looking for flowering stalks. Because plants may not bloom every year, SPDI may not be visible during a "quick" one-time only survey.
- C any new sites should be mapped and immediately reported to the Conservation Data Center and FWS (Snake River Basin Office).

Collection: Only designated FWS staff members and "agents of the Service"<sup>1</sup> can collect SPDI. Collecting should NOT be encouraged for biologists in other agencies or private individuals. Following is an excerpt from the draft sub-permit amendment request:

No more than three individuals or less than 5 percent of the population, whichever is less, at each site shall be collected. Specimens shall be preserved in accordance with currently accepted protocol and deposited with The Idaho Museum of Natural History, Idaho State University, Pocatello, Idaho.

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<sup>1</sup>"Agents of the Service" may include CDC staff that are under a Section 6 contract with FWS